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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/428,468	10/28/1999	SAID O. BELHAJ	BELHAJ5	4691

7590

05/22/2002

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EXAMINER

SPENCER, WILLIAM C

ART UNIT

PAPER NUMBER

2675

DATE MAILED: 05/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.	Applicant(s)	
09/428,468	BELHAJ, SAID O.	
Examiner	Art Unit	
William C. Spencer	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,4-6,8-10 and 14-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4-6 and 8 is/are allowed.
- 6) ☒ Claim(s) 9,10,14 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Fuldner et al., European Patent no. 0441129.

Fuldner discloses a switch matrix comprising sub-matrices T1 and T2, with columns S1-S4 (with Sn showing expandability) and rows R1-Rm. The circles T111-T2m4 around the matrix intersections are commonly used in the art to indicate the individual switches of a switch matrix; the matrix would have no purpose without them. Sub-matrices T1 and T2 each have a number of switches equal to the number of rows times the number of columns, and the total number of switches is twice the number of rows times the number of columns.

It could be argued that the actual rows of the matrix are R11-R1m plus R21-R2m. In view of the instant disclosure, and others, the main point of interest is the number of lines connected to active circuitry, and diodes and wiring may be considered part of the switching matrix. Even lacking translation, it appears that Fuldner also considers this to be the case (“Tastatur auf 2 (m x n) verdoppelt,” section 2.2, line 2). Active circuitry would require power connections, while a keyboard assembly in accordance with Fuldner would only require m x n connections; while today’s miniature circuitry may not result in a preference for a simple diode over an active component, this is a recent development.

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An English translation of the Abstract of Fuldner refers to "scan a keyboard." Inherently, a keyboard uses momentary pushbuttons switches.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuldner.

Refer to above discussion of claims 9 and 10.

It would have been obvious to one skilled in the art at the time of the invention that any type of switch can be scanned by a switch matrix, providing the operator knows not to connect too many switches at a time. The advantage is that more than one type of switch can be used.

5. Claims 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Valdenaire, U.S. Patent no. 5,677,687.

As to claim 16, FIG. 1 of Valdenaire discloses a prior art switching matrix with five rows R1-R5 and five columns C1-C5. The part of the figure on the left shows the rows being driven and the columns being read from. The part of the figure on the right shows the columns being driven and the rows being read from. Valdenaire's description of FIG. 1 in col. 1, lines 16-25 makes it clear that the thick "T" shapes of lines in the figure, similar to the art-recognized

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symbol for a pushbutton, and located at each intersection of a row and column, are key switches.

Valdenaire does not disclose the method of scanning the rows or columns one at a time.

It would have been known by one skilled in the art at the time of the invention that driving and reading the rows and columns one at a time would be equivalent to driving and reading the rows and columns as groups, except slower. While it would not be done this way in a performance-critical situation, it would not be unusual to use this method for a non-critical application or a test program. The program would use fewer instruction types and could even be as efficient in the case of monitoring the switching matrix with a microprocessor or programming language with weak bitwise instructions (for example, the original Microsoft BASIC programming language).

#### ***Allowable Subject Matter***

Claims 1, 4-6 and 8 are allowed.

#### ***Response to Arguments***

The amendment resolves formal matters.

Applicant's arguments filed 28 February 2002 have been fully considered but they are not persuasive. Original claim 11 was rejected as obvious in view of Fuldner and the amended claim 9 is now a 35 U.S.C. 102 rejection in light of translation.

The allowed claims include both the input/output of the rows and columns and the increased number of switches allowed by the technique. Claims 16-20 are rejected as lacking this combination of limitations. As no previous art rejection was made, this rejection is non-final to allow the Applicant an opportunity to respond.

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***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sasaki, Japanese Patent publication JP356027438A, discloses a switch matrix where the total number of switches is twice the number of rows times the number of columns.

Sakashita et al., U.S. Patent no. 4,138,917, Renschke, U.S. Patent no. 4,266,213, Bauer, U.S. Patent no. 4,673,933, and Bower, U.S. Patent no. 4,918,445 disclose switch matrices where both the rows and columns are driven.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Spencer whose telephone number is 703-306-5842.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Saras can be reached on 703-305-9720.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231


**or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,  
Arlington, VA, Sixth Floor (Receptionist).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



STEVEN SARAS  
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TECHNOLOGY CENTER 2600